

# SYMONS'S MONTHLY METEOROLOGICAL MAGAZINE.

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## METEOROLOGICAL BIBLIOGRAPHY. \*

Two events induce me again to consider this subject. The transfer of meteorological work in America from the Signal Service of the Army, to the Department of Agriculture, gives the *coup de grace* to the fulfilment by the Signal Service of the promise made to me by its former chief, General Hazen, that if I would let him have a copy of my catalogue of meteorological books he would undertake to print it. Relying on that promise, I sent him the originals of thousands of titles without keeping a copy, and after nearly ten years, all that anyone has, are the portions which General Greely was good enough to have type-written. However, it remains to be seen what Prof. Harrington with his splendid resources will do. All may end well, after all—for those, that is, who live long enough to see it.

The other event is the publication of the Catalogues of the Libraries of the Royal Meteorological Society and of the Deutsche Seewarte.

There are various subjects in connection with the subject in general which require consideration :—

1. *What is to be Catalogued?*—This seems to need little attention, but is really a very serious question. The 18,000 titles which I sent to America were those of books, pamphlets, or reprints from *Transactions*, &c.; with them have since been incorporated many thousand titles copied under Prof. Cleveland Abbé's direction from the Royal Society's *Catalogue of Scientific Papers*. This was the thin end of a wedge of infinite magnitude. No one appreciates more highly than I do the value of the Royal Society's *Catalogue*, but if the principle is once laid down that articles in periodicals are to be catalogued, it is difficult to see where to stop. If articles in the *Philosophical Magazine* are to be catalogued, why should not those in the *Meteorological Magazine*, in the *Zeitschrift*, in *Ciel et Terre*, &c.? and if in *Nature*, why not those in the *Times*, or the *English Mechanic*? A good illustration of the terrible way in which useful papers on meteorology are scattered is

\* *Katalog der Bibliothek der Deutschen-Seewarte zu Hamburg*. Hamburg : 1890, 8vo., viii.—619 pages.

*Catalogue of the Library of the Royal Meteorological Society*, compiled by J. S. Harding, junr., F.R.Met.Soc. London : Stanford, 1891, 8vo., vii.—214 pages.

afforded by page 2 of the *Catalogue* of the Royal Met. Soc. If all the letters and articles which some living meteorologists have written had to be catalogued, they would, in some cases for one author, make a respectable pamphlet. Moreover, there is the question of date. The Royal Society *Catalogue*, except in rare cases, begins only with the present century ; but a general meteorological bibliography should certainly be so designed as to help historians of the various branches of the science—and no one will suggest that history need not go back beyond 1800.

As all these titles of papers and articles have been got out, and *they are unquestionably useful as far as they go*, I think that they should be printed, but that it would be well by using two founts of type to indicate which are books, or reprinted articles, and which are merely references to serials.

2. *In what order should the entries be placed ?*—This is a point which has been much discussed. It depends a little, but not so much as has been supposed, upon what particular use is to be made of the catalogue, and there has lately been a tendency towards having catalogues broken up into subjects ; the idea being that such an arrangement facilitates research. I do not think so. There is no catalogue more handy to work with than Dr. Hellmann's *Repertorium*, yet its arrangement is primarily under authors' names. Again, the new *Catalogue* of the Roy. Met. Soc. (although it ought to have had proper head lines instead of useless ones) is, through the index at the end, a very handy work. On the contrary, the *Katalog* is grouped under subjects, and I find the publications of the Meteorological Society thus scattered :—

*The Reports*.—Page 10. Meteorologie-Allgemeines-Organisation und Methoden. *Modern Meteorology*. — Page 27. Meteorologie Allgemeines, Lehrbuecher, Geschichte, &c.

*Meteorol. Record*. — Page 104. Meteorologie - Geographische Meteorologie-Britische Inseln.

*Proceedings*.—Page 518. Zeitschriften, Veroffentlichungen von Gesellschaften. *Quarterly Journal*.—Page 529. Fachzeitschriften, Englische, &c.

I am not specially complaining of the *Katalog*, though the classification is frequently very droll, and in the above case the reason for putting the *Reports* on p. 10, and the *Quarterly Journal* on p. 529, instead of along with the *Proceedings* on p. 518, is not obvious—but I do hold that all the help afforded by classification is given by such an index as that in Hellmann's *Repertorium*, or in the Roy. Met. Soc. *Catalogue*.

On the other hand, I think that the time and brains of the custodians of libraries merit consideration, and from that point of view the advantage of alphabetical classification under authors' names is beyond dispute. Indexes of authors' names such as those at the end of the *Katalog*, of the Belgian *Catalogue*, or of Struve's splendid *Bibliotheca*, are useless for the identification of books ; one has always to turn back to the body of the work, and the labour thus thrown upon every

one whose duty it is to collect additional works for the library under his care, is immense.

Before concluding this section, I may give some illustrations of the hopelessness of trying to render subject classification a success. I had occasion recently to hunt up the original descriptions of some patterns of rain gauge. Buist's is in a volume which would be grouped under "Instructions"; Horner's and Jagga Rao's under "General Treatises"; Crosley's under "Patent Specifications" or "Instruments"; Hervé Mangon's and Stutter's under "Catalogues"; Stevenson's under "Periodicals"; Howard's under "Observations"; the Staff gauge under "Engineering" or "Water Supply"; and so on. Who would look under "Microscope" for an early article on Snow Crystals—as will be found in Hooke's *Micrographia*—or suppose that *Good Words* contained a thorough discussion of the influence of the full moon upon the amount of cloud.

It may be urged that classification under authors' names will lead to difficulties with reference to series of observations at public observatories. I think that it would, but surely that would be perfectly met by entering the observations under the name of the town, and the observer in his alphabetical position, with a cross reference to the town; we should thus have Pond, Airy, Christie, each in his proper place, each referring to Greenwich, where the publications would be entered in a continuous series.

There is one point not yet dealt with—a minor one, but worthy of consideration. Assuming, as I hope I may, that our Trans-Atlantic friends print the magnificent materials which they have obtained, and that they revert, as I hope they will, to the alphabetical order in which the cards were sent to them, there will still be the entering in the subject index to arrange. Should the entries therein run alphabetically or chronologically? I think that the latter is preferable, because it is by far the more handy for the historian—the work of chronological classification would be done once for all. This seems far to outweigh the slight advantage which the alphabetical arrangement affords for finding whether any particular person has written on any particular subject—which can be ascertained in two other ways—from the index if the date at which he lived is known, or from the body of the catalogue by running down the list of his works.

Turning, in conclusion, to the two catalogues, in order to infer therefrom the character and relative strength of the two libraries, I find it hopeless to make any strict comparison, partly because the two differ radically in their arrangement, and partly because the alphabetical index to the *Katalog* is incomplete. My impression is that the two libraries differ considerably, that the London one is the richer as regards old works (though even it is far behind that of the Société Météorologique de France), and that the Ham-burgh one is the richer in series of observations. The *Katalog* is by far the larger book, but it contains hundreds of titles of works which have nothing to do with meteorology; in fact the library would

have been improved had it been weeded, as was that of the Royal Meteorological Society, *e.g.*, what does the Seewarte want with such books as :

CLIFFORD, Thomas, Specification of the Patent granted to Mr. —, of the City of Bristol, Merchant; for his Invention of an entire new Mode of manufactring Nails of every kind, by Machinery never before made use of for that purpose. (Dated Juli 17, 1791.) (Aus: Repertory of Arts and Manufactures, Vol. VII. Number XL.) (S. 5622.)

CUMMINGS, George, Specification of the Patent granted to Mr. —, of Ludgate-street, London, Toiman; for his Invention of a Composition to put on all Sorts of Skins, Paper or Linen, for drawing or writing on with Pen and Ink, or Pencil, and rubbing clean off again. (Dated March 31, 1764.—Term expired.) (Aus: Repert. of Arts and Manufact., Vol. VII, Nr. XL.) (S. 5622.)

I am well aware of the difficulty of defining the sizes of books, fo. 4to., 8vo., &c., and have doubtless myself made many errors of that kind, but I am not sure that Dr. Neumayer decided wisely when he resolved that the *Katalog* should give no indication whatever as to size. As long as the present infinite variety of size of sheet prevails, there will be mistakes of 4to. for 8vo., and of 8vo. for 12mo., but I think that it is better to put up with a few such errors than to give no information at all.

Similarly, I wish that the Catalogue of the Royal Meteorological Society had been arranged in one alphabet instead of in seven sections.

But it is only when a work is completed that one can consider it as a whole. Success is the result of experience—even failures are useful as lessons—and I am not going to class either of these Catalogues as a failure. On the contrary, each is useful, and if their publication and this article, lead to further consideration of the whole subject, and to the issue in a workable form of the American Bibliography of Meteorology (in which doubtless the contents of each of the volumes before us would be incorporated), we should have a series of volumes of unique value to meteorological thinkers.

In conclusion, I invite any one who does not agree with the above views to state his objections. All meteorologists are interested in this work being done in the very best manner, and the more thoroughly the arrangements are discussed beforehand the better.

G. J. S.

## A RAINY AUGUST.

THE exceptional character of the rainfall of the past month induces us to offer to our readers details which are themselves a remarkable proof of the zeal and accuracy of our observers. It says something for the organization that without a single special letter or circular, we have received full details, not merely from the 150 correspondents

whose results we give every month, but from a nearly equal number of others. To have received, verified, and sent through the press within a fortnight after its close the reports of nearly 300 observers on an exceptional month, speaks well for the observers and the organization in general.

It may be thought that by giving abstracts of all these returns we are overdoing the subject, but if anyone will take the trouble to mark all the stations on a large map, he will find that, large as is the number, the cases of stations within several miles of the next nearest are rare, except in the English lakes, and there the fall has been so enormous, that all the details are of great interest. The observer who takes the gauges on Sca Fell and on some other mountains and those on the Sty, unfortunately took them two days too soon, so that his Augusts are too small, and his Septembers will be too large. We must, therefore, leave those figures out, and so Seathwaite is at the head of the list with 26.99 in., followed by Buttermere with 23.37 in., Borrowdale Vicarage with 22.25 in., and Mardale Haweswater with 20.20 in., and these again by upwards of twenty stations with totals between 10 in. and 20 in. Two stations in North Wales will be seen to have had 18.50 in. and 20.98 in. respectively.

In the special table on pages 118 and 119 we have given values which (subject to one correction) indicate well the areas of greatest excess. We refer to the column giving the ratio of the total fall in August, 1891, to the mean of August, 1880-89. From this it will be seen, for instance, that in London the fall was  $2\frac{1}{2}$  times the average, at several stations 3 times the average, and at Seathwaite nearly  $3\frac{1}{4}$  times the average. On the other hand, at Maidstone, Cheadle, Haverfordwest and Dublin, it was but a trifle above the average.

The correction above mentioned is that due to ten years being too short a period to give a trustworthy mean monthly fall. At most stations the mean for August, 1880-89 is lower than the true mean for a long period.

It does not seem desirable to try to epitomize the notes of the observers, but to refer readers to them. They will find therein many very interesting facts, especially with reference to the enormous fall on August 24th and 25th, ranging in the 48 hours, from 10.24 in. through 9.16 in., 8.25 in., 7.57 in. down to 5 inches, which seems to have prevailed as an average over at least 300 square miles in the English Lake district, but this must be worked out thoroughly in *British Rainfall*, 1891.

In order to ensure continuity, we leave the regular tables in their usual form; and in the special table on the following pages repeat the values for some of these stations, with the addition of the last two columns, which have been specially calculated in illustration of the exceptional character of the fall, and lastly we give in a list of notes an epitome of much that has come to us in various forms, but all sorted geographically in the order that the stations hold in *British Rainfall*

*Relation of Rainfall in August, 1891, to the Mean 1880-89.*

| STATION.               | COUNTY.           | August, 1891. |       | Ratio to<br>Mean<br>1880-89. | Max.<br>1880-89. |
|------------------------|-------------------|---------------|-------|------------------------------|------------------|
|                        |                   | Depth.        | Days. |                              |                  |
|                        |                   | in.           |       |                              | in.              |
| Camden Square.....     | Middlesex .....   | 4·75          | 22    | 2·5                          | 4·89             |
| Pinner Hill .....      | „ .....           | 4·16          | 21    | 2·2                          | 4·28             |
| Guildford .....        | Surrey .....      | 4·05          | 21    | 2·7                          | 4·23             |
| Maidstone .....        | Kent .....        | 3·03          | 20    | 1·8                          | 3·57             |
| Steyning.....          | Sussex .....      | 6·57          | 16    | 2·9                          | 5·87             |
| Ashdell, Alton .....   | Hants .....       | 6·02          | 23    | 2·7                          | 5·91             |
| Strathfield Turgiss .. | „ .....           | 3·81          | 26    | 2·2                          | 5·38             |
| Addington, Winslow..   | Bucks .....       | 4·96          | 23    | 2·5                          | 4·75             |
| Magdalen College.....  | Oxford .....      | 4·51          | 23    | 2·5                          | 4·64             |
| Bloxham, Banbury ...   | „ .....           | 4·61          | 21    | 2·2                          | 5·33             |
| Castle Ashby.....      | Northampton ..    | 4·61          | 22    | 2·1                          | 4·28             |
| Woodford .....         | Essex .....       | 5·23          | 23    | 2·6                          | 4·52             |
| Sheering, Harlow.....  | „ .....           | 3·87          | 25    | 2·0                          | 4·89             |
| Saffron Walden.....    | „ .....           | 3·77          | 25    | 1·8                          | 4·64             |
| Diss.....              | Norfolk.....      | 3·68          | 21    | 1·8                          | 4·73             |
| Swaffham .....         | „ .....           | 4·25          | 23    | 1·5                          | 4·52             |
| Salisbury .....        | Wilts .....       | 5·34          | 22    | 3·0                          | 5·96             |
| Devizes .....          | „ .....           | 7·25          | 24    | 3·1                          | 5·42             |
| Okehampton .....       | Devon .....       | 8·37          | 22    | 2·7                          | 6·14             |
| Barnstaple .....       | „ .....           | 6·08          | 21    | 2·1                          | 5·86             |
| Lynmouth .....         | „ .....           | 7·46          | 24    | 2·5                          | 5·84             |
| Probus .....           | Cornwall .....    | 6·29          | 19    | 2·5                          | 5·26             |
| Bodmin .....           | „ .....           | 8·31          | 26    | 2·9                          | 4·87             |
| Wells .....            | Somerset .....    | 6·74          | 23    | 2·7                          | 5·34             |
| Clifton .....          | Gloucester .....  | 7·44          | 22    | 2·5                          | 5·64             |
| Ross .....             | Hereford .....    | 4·90          | 24    | 2·4                          | 4·77             |
| Cheadle .....          | Stafford .....    | 4·89          | 25    | 1·6                          | 5·81             |
| Tenbury.....           | Worcester .....   | 4·01          | 21    | 1·9                          | 3·88             |
| Coventry .....         | Warwick .....     | 4·04          | 20    | 1·7                          | 5·61             |
| Barkby .....           | Leicester .....   | 3·27          | 23    | 1·3                          | 5·09             |
| Boston .....           | Lincoln.....      | 2·77          | 20    | 1·3                          | 4·32             |
| Horncastle .....       | „ .....           | 3·16          | 24    | 1·2                          | 4·57             |
| Hesley Hall .....      | Notts .....       | 3·29          | 20    | 1·5                          | 5·36             |
| Neston .....           | Cheshire .....    | 4·96          | 24    | 2·0                          | 4·46             |
| Walton, Liverpool, ... | Lancashire .....  | 5·79          | 20    | 2·1                          | 5·51             |
| Manchester .....       | „ .....           | 6·13          | 23    | 2·0                          | 6·00             |
| Darwen .....           | „ .....           | 9·75          | 25    | 2·6                          | 6·68             |
| Wetherby .....         | Yorks .....       | 3·20          | 14    | 1·4                          | 4·96             |
| Arncliffe.....         | „ .....           | 9·18          | 26    | 2·1                          | 7·21             |
| Ripon .....            | „ .....           | 4·08          | 24    | 1·6                          | 6·03             |
| Hull .....             | „ .....           | 3·79          | 22    | 1·4                          | 6·45             |
| East Layton .....      | „ .....           | 4·14          | 21    | 1·7                          | 6·96             |
| Mickleton .....        | „ .....           | 5·74          | 22    | 2·4                          | 6·46             |
| Halwhistle .....       | Northumberland    | 5·48          | 20    | 1·9                          | 6·54             |
| Newcastle .....        | „ .....           | 4·80          | 20    | 1·8                          | 6·22             |
| Seathwaite.....        | Cumberland.....   | 26·99         | 28    | 3·2                          | 13·53            |
| Llandovery .....       | Carmarthen.....   | 8·77          | 29    | 2·4                          | 6·64             |
| Haverfordwest .....    | Pembroke .....    | 6·11          | 20    | 1·9                          | 5·59             |
| Rhayader .....         | Radnor .....      | 7·38          | 26    | 1·7                          | 7·08             |
| Llandudno .....        | Carnarvon .....   | 4·19          | 16    | 1·8                          | 4·92             |
| Douglas ... ..         | Isle of Man ..... | 7·56          | 23    | 2·6                          | 5·32             |
| Cargen .....           | Kirkcudbright...  | 8·41          | 22    | 2·9                          | 4·59             |
| Jedburgh .....         | Roxburgh .....    | 4·93          | 21    | 2·2                          | 5·86             |

| STATION.              | COUNTY.           | AUGUST, 1891. |       | Ratio to<br>Mean<br>1880-89. | Max.<br>1880-90. |
|-----------------------|-------------------|---------------|-------|------------------------------|------------------|
|                       |                   | Depth.        | Days. |                              |                  |
|                       |                   | in.           |       |                              | in.              |
| Old Cumnock .....     | Ayr .....         | 6.39          | 27    | 1.9                          | 5.65             |
| Glasgow .....         | Renfrew .....     | 4.52          | 19    | 1.7                          | 4.35             |
| Lochgilthead.....     | Argyll .....      | 6.72          | 23    | 1.5                          | 6.54             |
| Appin .....           | " .....           | 6.45          | ...   | 1.4                          | 6.91             |
| Loch Leven .....      | Kinross.....      | 6.20          | ...   | 2.1                          | 5.60             |
| Dalnaspidal .....     | Perth .....       | 5.32          | 27    | 1.3                          | 7.81             |
| Dundee .....          | Forfar .....      | 4.35          | 16    | 1.7                          | 6.50             |
| Braemar .....         | Aberdeen.....     | 5.18          | 23    | 1.6                          | 7.57             |
| Keith .....           | Banff .....       | 5.34          | 27    | 1.8                          | 5.89             |
| Strome Ferry .....    | Ross .....        | 6.56          | 25    | 1.4                          | 7.74             |
| Cawdor .....          | Inverness .....   | 3.13          | 22    | 1.4                          | 5.12             |
| Scourie .....         | Sutherland .....  | 5.63          | 20    | 1.8                          | 6.14             |
| Dromore.....          | Kerry .....       | 6.24          | 23    | 1.3                          | 8.63             |
| Fermoy .....          | Cork .....        | 4.28          | 17    | ...                          | 5.20             |
| Brook Lodge.....      | Waterford .....   | 7.10          | 23    | 2.1                          | 6.52             |
| Derry Castle .....    | Tipperary.....    | 10.36         | 29    | 2.5                          | 6.60             |
| Ennis .....           | Clare .....       | 7.82          | 26    | 2.2                          | 5.41             |
| Miltown Malbay .....  | " .....           | 9.36          | 29    | 2.3                          | 6.64             |
| Browne's Hill .....   | Carlow .....      | 5.54          | 25    | 1.9                          | 5.13             |
| Dublin .....          | Dublin .....      | 4.95          | 25    | 1.9                          | 5.75             |
| Athlone .....         | Westmeath .....   | 7.67          | 27    | 2.1                          | 5.95             |
| Queen's College ..... | Galway.....       | 7.28          | 26    | 1.9                          | 5.50             |
| Ballinasloe.....      | " .....           | 6.82          | 24    | 2.1                          | 4.48             |
| Crossmolina .....     | Mayo.....         | 6.54          | 28    | 1.5                          | 7.02             |
| Seaforde.....         | Down .....        | 5.87          | 21    | 2.1                          | 5.55             |
| Waringstown .....     | " .....           | 6.04          | 29    | 1.9                          | 7.29             |
| Belfast .....         | Antrim .....      | 5.86          | 26    | 1.4                          | 7.98             |
| Creggan Res.....      | Londonderry ..... | 6.07          | 27    | 1.5                          | 7.95             |
| Omagh .....           | Tyrone .....      | 7.45          | 27    | 2.1                          | 5.69             |

## NOTES.

MOUNT VIEW ROAD, STROUD GREEN, N.—R 5.48 in.—*G. I. Gwilliam.*

MUSWELL HILL, MIDDLESEX.—R 4.96 in. on 23 days, greatest in August since 1879.—*S. G. Abethell.*

ETCHINGHAM PARK, FINCHLEY.—R 4.81 in. on 23 days.—*J. W. Scott.*

HAZELHURST, HASLEMERE.—R 6.33 in. on 26 days ; R every day after 16th ; 1.90 in. between 3 p.m. on 20th and 8 a.m. on 21st.—*T. P. Newman.*

HOLMFELS, REIGATE, SURREY.—R 4.36 in. on 22 days.—*F. P. Baker.*

WALLINGTON, SURREY.—R 4.82 in. on 25 days ; sunlight very deficient.—*F. C. Bayard.*

HYTHE, KENT.—R 4.04 in. on 22 days.—*H. B. Mackeson.*

WALMER, KENT.—R 3.09 in. on 18 days.—*H. R. L. Botting.*

CAMDEN PARK, TUNBRIDGE WELLS.—R 4.59 in. on 25 days, more than double the average of the previous 7 years.—*J. Weston.*

RIVERHEAD, SEVENOAKS.—R 3·68 in. on 23 days.—*J. B. Murdoch.*

KESTON TOWER, KENT.—R 4·72 in. on 21 days; not one hot day.—*G. Buchanan.*

LEYSDOWN, SHEPPEY.—R 2·34 in. on 21 days; wet and stormy, with little sunshine.—*A. Farbrother.*

ST. LAWRENCE, VENTNOR, I.W.—R 4·74 in.—*W. E. Kilburn.*

WATER WORKS OFFICE, VENTNOR.—R 5·29 in. on 22 days.

HEADLEY, HANTS.—R 5·34 in.—*A. F. Parbury.*

NEWBURY, BERKS.—R 5·37 in. on 24 days, daily after 16th.—*W. J. Cowper.*

WESTON, BERKS.—R 6·11 in.—*R. Osmond.*

TWYFORD, BERKS.—R 5·00 in. on 24 days; very wet and cold.—*E. Finch.*

FARINGDON, BERKS.—R 4·96 in. on 24 days.—*W. Dundas.*

BUNTINGFORD, HERTS.—R 3·55 in. on 23 days.—*A. E. Morse.*

BROXBOURNE, HERTS.—R 4·07 in. on 23 days.—*G. J. Newbery.*

GREAT MARLOW, BUCKS.—Comparative values for 1879 and 1891 :

|              | DEPTH.    |       | DAYS.           |       |
|--------------|-----------|-------|-----------------|-------|
|              | 1879.     | 1891. | 1879.           | 1891. |
|              | in.       | in.   |                 |       |
| June.....    | 5·25      | 2·39  | 19              | 9     |
| July.....    | 4·62      | 3·73  | 16              | 17    |
| August ..... | 7·38      | 5·32  | 15              | 20    |
|              | 17·25 in. |       | 46              |       |
|              |           |       | <i>J. Ford.</i> |       |

PETERBOROUGH INFIRMARY, NORTHAMPTON.—R 3·20 in.—*A. F. R. Platt.*

ALCONBURY, HUNTINGDON.—R 4·11 in. on 21 days.—*R. Conway.*

WOODBRIDGE, SUFFOLK.—R 3·40 in. on 22 days; harvest much injured.—*W. Page Phillips.*

RUSHALL, HARLESTON.—R 4·39 in. on 22 days.—*C. Gape.*

WYMONDHAM, NORFOLK.—R 3·72 in. on 23 days.—*E. B. Pomeroy.*

DENVER, NORFOLK.—R 3·78 in. on 21 days: very wet and stormy; corn beaten down and hay spoilt.—*J. M. DuPort.*

BISHOPS CANNINGS, DEVIZES.—R 7·25 in. ; the greatest previously recorded was 7·11 in. in October, 1875.—*C. W. Hony.*

THE PRIORY, MALMESBURY, WILTS.—R 7·05 in. on 21 days.—*Alfred W. Chubb.*

HAZELBURY BRYAN, DORSET.—R 9·07 in. on 18 days; great damage to crops.—*R. F. Wheeler.*

DRUID, ASHBURTON, DEVON.—R 8·55 in. on 22 days.—*F. Amery.*

NIDDERDALE, EXMOUTH.—R 5·22 in. on 22 days.—*Herbert Stewart.*

IVEDON, HONITON.—R 5·42 in. on 23 days.—*E. Stanley.*

HEALE HOUSE, LITTLEHAM, BIDEFORD.—R 7·67 in. on 21 days; August average for 15 years is 3·51 in., and the highest previously was 5·79 in. in 1879.—*R. Sanders.*

HARTLAND ABBEY, DEVON.—R 7·03 in. on 21 days.—*G. Sleep.*

MORVAH, CORNWALL.—R 7·90 in.—*J. H. Thomas.*

WELLS, SOMERSET.—R 6·74 in. on 23 days.—*R. J. Manning.*

WESTON-SUPER-MARE.—R 7·17 in. on 23 days, unusually cold and wet.—*H. Alford.*

ALMONDSBURY, GLOUCESTER.—R 7·09 in. on 24 days.—*C. O. Miles.*

LLANTHONY LOCK, GLOUCESTER.—R 5·50 in. on 18 days.—*H. J. Marten.*

MAISEMORE LOCK, GLOUCESTER.—R 5·49 in. on 25 days.—*H. J. Marten.*

HEATH LODGE, CHELTENHAM.—R 4·80 in. on 23 days.—*M. A. Smelt.*

SOUTHAM VILLA, CHELTENHAM.—R 4·86 in. on 22 days.—*R. Tyrer.*

UPPER LODGE, TEWKESBURY.—R 4·67 in. on 22 days.—*H. J. Marten.*

ROSS, HEREFORD.—R 4·90 in., greatest in August since 1879 (5·78 in.)—*H. Southall.*

BURWARTON, SALOP.—R 4·94 in. on 24 days.—*A. James.*

HOAR CROSS, BURTON, STAFFORD.—R 4·12 in. on 19 days.—*F. W. Lycett.*

BEVERE LOCK, WORCESTER.—R 3·43 in. on 22 days.—*H. J. Marten.*

HOLT LOCK, DROITWICH.—R 3·80 in. on 21 days.—*H. J. Marten.*

LINCOMB, STOURPORT.—R 4·15 in. on 20 days.—*H. J. Marten.*

BEDWORTH, WARWICKSHIRE.—R 3·54 in. on 16 days.—*D. Bosworth.*

ROTHERBY HALL, LEICESTERSHIRE.—R 3·83 in. on 25 days; weather very wet and cold.—*J. Hames.*

HEMINGBY, HORNCastle.—R 3·90 in. on 21 days.—*E. S. Bengough.*

APPLEBY, BRIGG, LINCOLN.—R 4·68 in. *A. E. Brown Constable.*

WILLINGTON, DERBY.—R 3·44 in. on 22 days.—*G. A. Smallwood.*

MIDLAND RAILWAY, DERBY.—R 3·55 in. on 21 days.—*W. Langdon.*

DUNSDALE, FRODSHAM, CHESHIRE.—R 4·03 in. on 21 days.—*J. Simpson.*

TRAINING COLLEGE, WARRINGTON.—R 4·81 in. on 22 days.—*J. Feniman.*

WITHINGTON, LANCASHIRE.—R 5·50 in. on 20 days; this is less than in 1889, when 5·69 in. fell.—*J. King, jr.*

THE PARK, BOLTON.—R 8·18 in. on 25 days; this is 3·22 in. above the average.—*W. W. Midgley.*

DARWEN.—R 9·75 in. on 25 days; the most yet recorded in any month.—*W. H. Blamire.*

HAIGHTON, PRESTON.—R 9·89 in. on 28 days.—*J. J. Myres.*

ELSWICK LODGE, ECCLESTON.—R 9·54 in., being more than double the average for 19 years, and within 0·84 in. of equal to the total of the previous seven months. Previously we have only once had more than 7 in., viz., 7·19 in. in August, 1881.—*S. King.*

BARNSFOLD, BEATON FELL.—R 10·27 in. on 28 days; monthly gauge gave 10·25 in.—*J. J. Myres.*

CALDER MOUNT, GARSTANG.—R 9·63 in.; previously the wettest month for at least 24 years was September, 1872, 9·51 in.—*Sydney Wilson.*

LANCASTER.—R 11·47 in. on 29 days ; the total for the previous seven months was only 11·56 in., so that August alone nearly equalled them. The largest daily fall previously recorded was 2·25 in. on October 6th, 1874 ; but on August, 24th, 1891, we had 2·30 in., and on the next day 2·38 in.—*W. O. Roper.*

ESTHWAITE LODGE, HAWKSHEAD.—R 13·30 in. on 26 days ; between 3 p.m. on 24th and 9 p.m. on 25th—*i.e.*, in 30 hours—4·48 in. fell, and 5·17 in. in the 48 hours ending 9 a.m. on 26th.—*W. Alcock-Beck.*

SEATHWAITE VICARAGE, DUDDON VALLEY.—R 16·39 in. on 26 days ; the wettest for many years ; five days with more than an inch upon each ; the 24th gave 2·94 in. and the 25th 2·99 in., or 5·93 in. in 48 hours.—*S. R. M. Walker.*

MONK CONISTON PARK.—R 14·29 in. on 23 days.—*S. A. Marshall.*

BLACK FELL, HAWKSHEAD.—R 13·55 in.—*S. A. Marshall.*

SKELWITH FOLD, AMBLESIDE.—R 14·65 in. on 26 days.—*S. A. Marshall.*

CHERRY BANK, ILKLEY, YORKS.—R 5·51 in.—*H. Richardson.*

BRIGFLATTS, SEDBERGH, YORKS.—R 13·51 in. on 26 days ; 3·11 in. on 24th, and 2·18 in. on 25th.—*J. Handley.*

HOUGHTON, MARKET WRIGHTON.—R 3·69 in.—*J. Wells.*

NORTON, MALTON.—R 4·41 in. on 20 days ; crops damaged.—*E. K. Spiegelhalter.*

INGLEBY GREENHOW, YORKS.—R 4·71 in. on 24 days.—*J. Hawell.*

WHORLTON, BARNARD CASTLE, DURHAM.—R 4·04 in. on 22 days.—*F. A. Dodgson.*

BINGFIELD, NORTHUMBERLAND.—R 5·47 in. ; only previously equalled in August since 1876 by '1877, 7·89 in. ; 1881, 5·70 in. ; and 1890, 5·75 in.—*J. Coppin.*

CHATTON, BELFORD.—R 4·18 in. on 26 days.—*R. Bell.*

LEYFIELD, MILLOM, CUMBERLAND.—R 8·46 in. ; very wet month, harvest spoiling.—*C. Vaughan.*

ULPHA VICARAGE, DUDDON VALLEY.—R 14·39 in. on 25 days ; 5·07 in. in 48 hours to 9 a.m. on 26th.—*W. Kewley.*

ESKDALE.—R 14·06 in. on 27 days.—*R. Herbert Snape.*

NETHER WASDALE.—R 10·34 in. on 24 days, all agricultural work much impeded.—*J. Baker.*

BORROWDALE VICARAGE.—R 22·25 in. on 27 days ; 8·26 in. in 48 hours ending 9 a.m. 26th.—*J. Taylor.*

HASSNESS, BUTTERMERE.—R 23·37 in. on 29 days ; 9·16 in. in 48 hours ending 9 a.m. 26th.—*S. Stewart.*

GRANGE, BORROWDALE.—R 18·88 in. on 26 days ; 7·57 in. in 48 hours ending 9 a.m. 26th.—*J. Threlkeld.*

HALLSTEADS, ULLSWATER.—R 9·67 in.—*S. A. Marshall.*

DERWENT ISLAND, KESWICK.—R 12·28 in. on 28 days.—*S. A. Marshall.*

THE BEECHES, KESWICK.—R 12·18 in. on 26 days ; cold and rainy.—*T. Paulin.*

- MELMERBY, KIRKOSWALD.—R 6·78 in. on 25 days.—*A. C. Pittar.*  
 ULDALE, MEALSGATE.—R 9·55 in. on 20 days.—*J. Greenwood.*  
 NOOK COTTAGE, AMBLESIDE.—R 14·77 in., or nearly three times the average.—*E. Hird.*  
 KIRKSTONE PASS, AMBLESIDE.—R 12·82 in. on 28 days.—*P. M. Dixon.*  
 MARDALE, HAWESWATER.—R 20·20 in.—*N. M. Sargeant.*  
 PATTERDALE, ULLSWATER.—R 15·87 in. on 27 days.—*S. A. Marshall.*  
 SWARTHFELL, ULLSWATER.—R 10·30 in.—*E. Bardgett.*  
 BARTON HALL, PENRITH.—R 7·80 in.—*J. H. Cumpston.*  
 THE HENDRE, MONMOUTH.—R 6·20 in. on 21 days.—*T. Coomber.*  
 LLANVIHANGEL COURT, ABERGAVENNY.—R 5·31 in. on 21 days; cereals very backward and much damaged.—*N. G. Sturt.*  
 SKETTY, SWANSEA.—R 8·02 in.; exceptionally wet.—*T. Travers Wood.*  
 PENTY PARK, PEMBROKE.—R 6·24 in. on 19 days.—*F. L. Lloyd Philipps.*  
 EDNOL, NEW RADNOR.—R 6·10 in. on 23 days.—*W. Jones.*  
 CLATTERBRUNE, PRESTEIGN.—R 5·59 in. on 21 days.—*J. Winfield.*  
 LAKE VYRNWY, MONTGOMERY.—R 9·34 in. on 25 days.—*H. J. Marten.*  
 RHIWBRIFDIR, MERIONETH.—R 18·50 in. on 22 days.—*R. Roberts.*  
 GLYN PADARN, LLANBERIS, CARNARVON.—R 20·98 in. on 22 days; 3·42 in. on 24th, and 3·05 in. on 25th, or 6·47 in. in the two days.—*F. Muckleton-Allen.*  
 GOREBRIDGE, EDINBURGH.—R 6·84 in. on 25 days.—*L. A. Anstruther.*  
 BLACKET PLACE, EDINBURGH.—R 5·21 in. on 25 days; very bad for farmers.—*R. C. Mossman.*  
 INVERARY, ARGYLL.—R 7·21 in. on 26 days.—*D. Little.*  
 AIRDS, ARGYLL.—R 6·45 in.—*A. M. Lachlan.*  
 DRIMNIN, MORVERN, ARGYLL.—R 6·20 in. on 24 days.—*M. J. Gordon.*  
 WICK, H.R.S., CAITHNESS.—R 4·53 in. on 13 days.—*D. Macgregor.*  
 HURDLESTOWN, CLARE.—R 8·44 in. on 27 days; this is just double the average for August, and the greatest in any month for seven years. All cut hay is rotten, and the corn is in a bad state.—*W. Bentley.*  
 WOODLAWN, GALWAY.—R 8·66 in. on 25 days.—*A. Porter.*  
 AGOLAGH, ANTRIM.—R 4·09 in. on 21 days.—*S. A. Brenan.*  
 CARRABLUGH, LOCH SWILLY, DONEGAL.—R 6·65 in. on 27 days; cold, wet and unseasonable.—*H. C. Hart.*

## CLIMATOLOGICAL TABLE FOR THE BRITISH EMPIRE, FEB., 1891.

| STATIONS.<br><br>(Those in italics are<br>South of the Equator.) | Absolute. |       |          |       | Average. |       |               |           | Absolute.       |                   | Total Rain. |       | Aver. |
|------------------------------------------------------------------|-----------|-------|----------|-------|----------|-------|---------------|-----------|-----------------|-------------------|-------------|-------|-------|
|                                                                  | Maximum.  |       | Minimum. |       | Max.     | Min.  | Dew<br>Point. | Humidity. | Max. in<br>Sun. | Min. on<br>Grass. | Depth.      | Days. |       |
|                                                                  | Temp.     | Date. | Temp.    | Date. |          |       |               |           |                 |                   |             |       |       |
|                                                                  | °         |       | °        |       | °        | °     | °             | 0-100     | °               | °                 | inches      |       |       |
| England, London .....                                            | 61·2      | 28    | 24·2     | 23    | 46·0     | 32·5  | 35·2          | 89        | 83·8            | 19·7              | ·01         | 1     | 5·9   |
| Malta.....                                                       | 61·5      | 27    | 37·7     | 20    | 56·0     | 44·5  | 41·6          | 79        | 127·8           | 33·9              | 3·80        | 12    | 5·7   |
| Cape of Good Hope ...                                            | 86·1      | 28    | 50·2     | 21    | 75·4     | 57·6  | ...           | ...       | ...             | ...               | 1·01        | 9     | ...   |
| Mauritius.....                                                   | 86·0      | 4     | 69·0     | 19    | 83·1     | 74·2  | 70·6          | 79        | 136·7           | 63·3              | 4·32        | 19    | 6·2   |
| Calcutta.....                                                    | 87·1      | 28    | 46·2     | 7     | 80·7     | 58·4  | 57·2          | 67        | 145·2           | 37·5              | ·91         | 3     | 2·2   |
| Bombay.....                                                      | 87·7      | 15    | 58·5     | 9     | 82·3     | 66·9  | 61·7          | 65        | 135·9           | 43·4              | ·00         | 0     | 0·7   |
| Ceylon, Colombo .....                                            | 91·1      | 10    | 68·3     | 1     | 86·9     | 72·5  | 70·3          | 76        | 148·0           | 58·0              | 2·81        | 12    | 3·7   |
| Melbourne.....                                                   | 100·6     | 14    | 45·0     | 6     | 75·4     | 53·7  | 49·6          | 61        | 148·5           | 30·9              | ·37         | 4     | 4·2   |
| Adelaide .....                                                   | 102·7     | 8     | 50·0     | 16    | 82·9     | 58·8  | 48·8          | 46        | 159·9           | 40·1              | ·08         | 2     | 1·6   |
| Tasmania, Hobart.....                                            | 91·0      | 9     | 42·7     | 23    | 68·6     | 51·2  | 49·4          | 67        | 143·0           | 37·5              | ·75         | 12    | 6·7   |
| Wellington .....                                                 | 79·0      | 11    | 47·5     | 16    | 68·2     | 54·3  | 57·3          | 88        | 135·0           | 39·0              | 4·42        | 13    | 4·2   |
| Auckland .....                                                   | 80·0      | 1     | 56·5     | 25    | 74·5     | 60·9  | 58·5          | 72        | 143·0           | 44·0              | 9·17        | 10    | 6·0   |
| Jamaica, Kingston.....                                           | 90·2      | 1     | 63·6     | 5     | 86·7     | 66·9  | 64·4          | 67        | ...             | ...               | ·27         | ...   | ...   |
| Trinidad .....                                                   | 90·0      | 1     | 63·0     | 5     | 85·3     | 67·4  | 67·6          | 73        | 155·0           | 57·0              | ·92         | 11    | ...   |
| Toronto .....                                                    | 49·0      | 25    | 2·1      | 4     | 34·8     | 20·8  | 24·0          | 79        | ...             | —1·5              | 2·65        | 19    | 6·6   |
| New Brunswick,<br>Fredericton .....                              | 49·5      | 25    | —14·2    | 20    | 28·9     | 3·6   | 14·5          | 73        | ...             | ...               | 3·55        | 13    | 6·2   |
| Manitoba, Winnipeg ...                                           | 24·0      | 6     | —34·5    | 1     | 5·6      | —18·5 | —3·9          | 99        | ...             | ...               | ·88         | 12    | 4·7   |
| British Columbia,<br>Esquimalt .....                             | 45·0      | 19    | 23·1     | 16    | 38·6     | 29·3  | 30·6          | 87        | ...             | ...               | 2·62        | 19    | 7·0   |

## FEBRUARY, 1891. REMARKS.

MALTA.—Mean temp. 49°·5; mean hourly velocity of wind 10·5 miles. Sea temp. rose from 56°·8 to 58°·0. L on 11th and 14th; H on 8th and 19th. A violent gale from N.E. on 15th averaged 32 miles per hour for 24 hours, and caused great damage in the harbour.

J. SCOLES.

Mauritius.—Mean temp. of air 0°·1 below, of dew point 0°·6 above, and rainfall 1·78 in. below, their respective averages. Mean hourly velocity of wind 11·5 miles, or 0·3 above the average; extremes, 40·0 on 6th and 1·7 on 2nd; prevailing direction S.E. by E.

C. MELDRUM, F.R.S.

CEYLON, COLOMBO.—L was seen on the 5th, 6th, 7th and 8th.

J. C. H. CLARKE, Lieut.-Col., R.E.

Melbourne.—Mean temp. of air 1°·7, of dew point 3°·6, humidity 5, cloud 1·1, and rainfall 1·55 in., below their respective averages. Prevailing wind S. Hot wind on 14th. Heavy dew on 8 days. L on 21st.

R. L. J. ELLERY, F.R.S.

Adelaide.—Mean temp. 3°·0, and rainfall ·60 in., below the average of 34 years. A very large number of clear days (15), and mean amount of cloud at 9 p.m. only 0·8.

C. TODD, F.R.S.

Wellington.—Showery during the first few days with strong N.W. wind, then fine weather with S.E. wind till 12th, when R commenced and continued to evening of the 14th, 1·70 in. falling on the 13th. The remainder of the month was fine, with occasional showers; wind chiefly southerly. Some very warm weather at times. L on night of 28th. Mean temp. 1°·3 below, and rainfall ·87 in. below, the average. R. B. GORE.

Auckland.—A rainy and unsettled month, the total rainfall being nearly three times the average—the remarkable fall of 4·02 in. being registered on the 22nd.

T. F. CHEESEMAN.

SUPPLEMENTARY TABLE OF RAINFALL,  
AUGUST, 1891.

[For the Counties, Latitudes, and Longitudes of most of these Stations,  
see *Met. Mag.*, Vol. XIV., pp. 10 & 11.]

| Div.  | STATION.                   | Total<br>Rain. | Div.   | STATION.                 | Total<br>Rain. |
|-------|----------------------------|----------------|--------|--------------------------|----------------|
|       |                            | in             |        |                          | in.            |
| II.   | Dorking, Abinger Hall.     | 5·85           | XI.    | Builth, Llanwrtyd Wells  | 9·25           |
| „     | Margate, Birchington...    | ...            | „      | Rhayader, Nantgwillt..   | 7·38           |
| „     | Brighton, Prestonville Rd. | 5·12           | „      | Corwen, Rhug .....       | 4·57           |
| „     | Hailsham .....             | 7·53           | „      | Carnarvon, Cocksidia ... | 6·00           |
| „     | Ryde, Thornbrough .....    | 6·80           | „      | I. of Man, Douglas ..... | 7·56           |
| „     | Alton, Ashdell .....       | 6·02           | XII.   | Stoneykirk, Ardwell Ho.  | 6·74           |
| III.  | Oxford, Magdalen Col...    | 4·51           | „      | New Galloway, Glenlee    | 6·68           |
| „     | Banbury, Bloxham .....     | 4·61           | „      | Melrose, Abbey Gate ...  | 5·63           |
| „     | Northampton .....          | 3·25           | XIII.  | N. Esk Res. [Penicuik]   | 6·60           |
| „     | Cambridge, Fulbourne..     | 4·82           | XIV.   | Ballantrae, Glendrishaig | 6·39           |
| „     | Wisbech, Bank House..      | 3·90           | „      | Glasgow, Queen's Park.   | 4·52           |
| IV.   | Southend .....             | 2·67           | XV.    | Islay, Gruinart School.. | 7·13           |
| „     | Harlow, Sheering ...       | 3·87           | XVI.   | Dollar .....             | 4·97           |
| „     | Rendlesham Hall .....      | 3·66           | „      | Balquhidder, Stronvar..  | 8·08           |
| „     | Diss .....                 | 3·68           | „      | Coupar Angus Station..   | 4·82           |
| „     | Swaffham .....             | 4·25           | „      | Dunkeld, Inver Braan..   | 6·57           |
| V.    | Salisbury, Alderbury ...   | 5·34           | „      | Dalnaspidal H.R.S. ...   | 5·32           |
| „     | Warminster .....           | ...            | XVII.  | Keith H.R.S. ....        | 5·34           |
| „     | Bishop's Cannings .....    | 7·25           | „      | Forres H.R.S. ....       | 2·45           |
| „     | Ashburton, Holne Vic...    | 10·64          | XVIII. | Fearn, Lower Pitkerrie.  | 2·96           |
| „     | Okehampton, Oaklands.      | 8·37           | „      | Loch Shiel, Glenaladale  | 11·24          |
| „     | Lynmouth, Glenthorne.      | 7·46           | „      | N. Uist. Loch Maddy ...  | 3·78           |
| „     | Probus, Lamelllyn .....    | 6·29           | „      | Invergarry .....         | 6·55           |
| „     | Launceston, S. Petherwin   | ...            | „      | Aviemore H.R.S. ....     | 3·92           |
| „     | Wincanton, Stowell Rec.    | 5·52           | „      | Loch Ness, Drumnadrochit | 3·42           |
| „     | Wells, Westbury .....      | ...            | XIX.   | Lairg H.R.S. ....        | ...            |
| VI.   | Bristol, Clifton .....     | 7·44           | „      | Scourie .....            | 5·63           |
| „     | Ross, the Graig .....      | 4·90           | „      | Watten H.R.S. ....       | 4·46           |
| „     | Wem, Clive Vicarage ...    | 4·70           | XX.    | Dunmanway, Coolkelure    | 8·90           |
| „     | Cheadle, The Heath Ho.     | 4·89           | „      | Fermoy, Gas Works ...    | 4·28           |
| „     | Worcester, Diglis Lock     | 3·75           | „      | Darrynane Abbey .....    | 5·52           |
| „     | Coventry, Coundon .....    | 4·04           | „      | Tipperary, Henry Street  | 5·94           |
| VII.  | Ketton Hall [Stamford]     | 3·40           | „      | Limerick, Kilcornan ...  | 6·21           |
| „     | Grantham, Stainby .....    | 4·06           | „      | Ennis .....              | 7·82           |
| „     | Horncastle, Bucknall ...   | 3·16           | „      | Miltown Malbay .....     | 9·36           |
| „     | Worksop, Hodsck Priory     | 3·11           | XXI.   | Gorey, Courtown House    | 5·57           |
| VIII. | Neston, Hinderton .....    | 4·96           | „      | Mullingar, Belvedere ... | 7·69           |
| „     | Knutsford, Heathside ...   | 5·54           | „      | Athlone, Twyford .....   | 7·67           |
| „     | Lancaster, Eadenbeck ...   | 11·47          | „      | Longford, Currygrane ... | ...            |
| „     | Broughton-in-Furness...    | 10·38          | XXII.  | Galway, Queen's Coll...  | 7·28           |
| IX.   | Ripon, Mickley .....       | 4·08           | „      | Crossmolina, Enniscoe..  | 6·54           |
| „     | Scarborough, West Bank     | 4·14           | „      | Collooney, Markree Obs.  | 7·14           |
| „     | East Layton [Darlington]   | 4·14           | „      | Ballinamore, Lawderdale  | 7·11           |
| „     | Middleton, Mickleton..     | 5·74           | „      | Lough Sheelin, Arley ..  | 7·38           |
| X.    | Haltwhistle, Unthank..     | 5·48           | XXIII. | Warrenpoint .....        | 5·75           |
| „     | Bamburgh .....             | 3·92           | „      | Seaforde .....           | 5·87           |
| „     | Shap, Copy Hill .....      | ...            | „      | Belfast, New Barnsley..  | 5·86           |
| XI.   | Llanfrechfa Grange .....   | 8·75           | „      | Bushmills, Dundarave...  | 5·75           |
| „     | Llandovery .....           | 8·77           | „      | Stewartstown .....       | 5·39           |
| „     | Castle Malgwyn .....       | 4·49           | „      | Buncrana .....           | 5·23           |

## AUGUST, 1891.

| Div.   | STATIONS.<br>[The Roman numerals denote the<br>division of the Annual Tables to<br>which each station belongs.] | RAINFALL.      |                                                |                                  |                 |      | Days on which<br>·01 or more fell. | TEMPERATURE.    |      |                 |           | No. of<br>Nights<br>below<br>32° |
|--------|-----------------------------------------------------------------------------------------------------------------|----------------|------------------------------------------------|----------------------------------|-----------------|------|------------------------------------|-----------------|------|-----------------|-----------|----------------------------------|
|        |                                                                                                                 | Total<br>Fall. | Differ-<br>ence<br>from<br>average.<br>1880-9. | Greatest<br>Fall in<br>24 hours. |                 | Max. |                                    | Min.            |      | In shade.       | On grass. |                                  |
|        |                                                                                                                 |                |                                                | Dpth                             | Date            |      |                                    |                 |      |                 |           |                                  |
|        |                                                                                                                 |                |                                                |                                  |                 |      |                                    | Deg.            | Date |                 |           |                                  |
| I.     | London (Camden Square) ...                                                                                      | 4·75           | + 2·87                                         | 1·44                             | 20              | 22   | 75·8                               | 14              | 43·2 | 30              | 0         | 0                                |
| II.    | Maidstone (Hunton Court)...                                                                                     | 3·03           | + 1·34                                         | ·82                              | 20              | 20   | ...                                | ...             | ...  | ...             | ...       | ...                              |
| III.   | Strathfield Turgiss .....                                                                                       | 3·81           | + 2·10                                         | 1·14                             | 20              | 26   | 77·3                               | 14              | 43·1 | 4               | 0         | 0                                |
| III.   | Hitchin .....                                                                                                   | 3·42           | + 1·60                                         | 1·39                             | 20              | 25   | 79·0                               | 14              | 39·0 | 30              | 0         | 0                                |
| IV.    | Winslow (Addington) .....                                                                                       | 4·96           | + 2·99                                         | 1·20                             | 20              | 23   | 76·0                               | 14              | 37·0 | 30              | 0         | 0                                |
| IV.    | Bury St. Edmunds (Westley)                                                                                      | 3·77           | + 1·57                                         | ·95                              | 20              | 20   | ...                                | ...             | ...  | ...             | ...       | ...                              |
| V.     | Norwich (Cossey) .....                                                                                          | 3·46           | ...                                            | ·80                              | 20              | 22   | ...                                | ...             | ...  | ...             | ...       | ...                              |
| V.     | Weymouth (Langton Herring)                                                                                      | 5·68           | + 3·75                                         | 1·78                             | 20              | 21   | 69·0                               | 13 <sup>b</sup> | 47·0 | 30              | 0         | 0                                |
| "      | Barnstaple .....                                                                                                | 6·08           | + 3·12                                         | 1·14                             | 28              | 21   | 68·0                               | 6, 14           | 42·0 | 30              | 0         | ...                              |
| "      | Bodmin (Fore Street) .....                                                                                      | 8·31           | + 5·46                                         | 1·54                             | 20              | 26   | ...                                | ...             | ...  | ...             | ...       | ...                              |
| VI.    | Stroud (Upfield) .....                                                                                          | 6·65           | + 4·56                                         | 1·51                             | 27              | 23   | 77·0                               | 14              | 43·0 | 29              | 0         | 0                                |
| "      | Church Stretton (Woolstaston)                                                                                   | 4·49           | + 1·73                                         | ·46                              | 25              | 25   | 68·5                               | 14              | 46·0 | 1, 30           | 0         | 0                                |
| "      | Tenbury (Orleton) .....                                                                                         | 4·01           | + 1·89                                         | ·67                              | 17              | 21   | 75·0                               | 14              | 37·0 | 30              | 0         | 0                                |
| VII.   | Leicester (Barkby) .....                                                                                        | 3·27           | + ·83                                          | ·37                              | 26              | 23   | 78·0                               | 14              | 36·0 | 29              | 0         | 1                                |
| "      | Boston .....                                                                                                    | 2·77           | + ·65                                          | ·45                              | 27              | 20   | 75·0                               | 14              | 42·0 | 5               | 0         | 0                                |
| "      | Hesley Hall [Tickhill] .....                                                                                    | 3·29           | + 1·13                                         | ·56                              | 13              | 20   | 72·0                               | 2 <sup>c</sup>  | 41·0 | 30              | 0         | 0                                |
| VIII.  | Manchester (Plymouth Grove)                                                                                     | 6·13           | + 3·04                                         | ·80                              | 2               | 23   | 76·0                               | 24              | 41·0 | 29              | 0         | 0                                |
| IX.    | Wetherby (Ribston Hall) ...                                                                                     | 3·20           | + ·86                                          | ·43                              | 18              | 14   | ...                                | ...             | ...  | ...             | ...       | ...                              |
| "      | Skipton (Arncliffe) .....                                                                                       | 9·18           | + 4·85                                         | 1·23                             | 23              | 26   | 70·0                               | 4               | 36·0 | 30              | 0         | ...                              |
| "      | Hull (Pearson Park) .....                                                                                       | 3·79           | + 1·15                                         | ·54                              | 13              | 22   | ...                                | ...             | ...  | ...             | ...       | ...                              |
| X.     | Newcastle (Town Moor) .....                                                                                     | 4·80           | + 2·09                                         | ·95                              | 21              | 20   | ...                                | ...             | ...  | ...             | ...       | ...                              |
| "      | Borrowdale (Seathwaite) .....                                                                                   | 26·99          | + 18·54                                        | 6·14                             | 24              | 28   | ...                                | ...             | ...  | ...             | ...       | ...                              |
| XI.    | Cardiff (Ely) .....                                                                                             | 8·23           | + 4·62                                         | 1·12                             | 26              | 21   | ...                                | ...             | ...  | ...             | ...       | ...                              |
| "      | Haverfordwest .....                                                                                             | 6·11           | + 2·93                                         | 1·12                             | 9               | 20   | 68·8                               | 10              | 39·9 | 30              | 0         | ...                              |
| "      | Carno (Tybrith) .....                                                                                           | 5·75           | + 1·98                                         | 1·01                             | 25              | 24   | 65·0                               | 19              | 36·0 | 22              | 0         | ...                              |
| "      | Llandudno .....                                                                                                 | 4·19           | + 1·83                                         | ·57                              | 8               | 16   | 69·5                               | 18              | 47·0 | 30              | 0         | 0                                |
| XII.   | Cargen [Dumfries] .....                                                                                         | 8·41           | + 5·42                                         | 1·27                             | 2               | 22   | 69·4                               | 3               | 38·8 | 30              | 0         | 0                                |
| "      | Jedburgh (Sunnyside) .....                                                                                      | 4·93           | + 2·69                                         | 1·07                             | 21              | 21   | 68·0                               | 14 <sup>d</sup> | 39·0 | 30              | 0         | ...                              |
| XIV.   | Old Cumnock .....                                                                                               | 6·39           | + 2·97                                         | ·82                              | 25              | 27   | ...                                | ...             | ...  | ...             | ...       | ...                              |
| XV.    | Lochgilthead (Kilmory) .....                                                                                    | 6·72           | + 2·16                                         | ·78                              | 17 <sup>a</sup> | 23   | ...                                | ...             | 37·0 | 29              | 0         | ...                              |
| "      | Oban (Craigvarren) .....                                                                                        | ...            | ...                                            | ...                              | ...             | ...  | ...                                | ...             | ...  | ...             | ...       | ...                              |
| "      | Mull (Quinish) .....                                                                                            | 7·62           | + 3·47                                         | 1·51                             | 31              | 23   | ...                                | ...             | ...  | ...             | ...       | ...                              |
| XVI.   | Loch Leven Sluices .....                                                                                        | 6·20           | + 3·26                                         | 1·50                             | 26              | 11   | ...                                | ...             | ...  | ...             | ...       | ...                              |
| "      | Dundee (Eastern Necropolis)                                                                                     | 4·35           | + 1·78                                         | ·85                              | 17              | 16   | 68·4                               | 19 <sup>e</sup> | 40·3 | 29              | 0         | 0                                |
| XVII.  | Braemar .....                                                                                                   | 5·18           | + 1·85                                         | 1·21                             | 3               | 23   | 65·8                               | 7               | 36·0 | 3               | 0         | 3                                |
| "      | Aberdeen (Cranford) .....                                                                                       | 4·77           | ...                                            | 1·06                             | 17              | 22   | 70·0                               | 1, 8            | 37·0 | 29              | 0         | 0                                |
| XVIII. | Strome Ferry .....                                                                                              | 6·56           | + 1·89                                         | 1·00                             | 25              | 25   | ...                                | ...             | ...  | ...             | ...       | ...                              |
| "      | Inverness (Culloden) .....                                                                                      | 2·60           | + ·60                                          | ·77                              | 26              | ...  | 70·0                               | 19              | 37·0 | 30              | 0         | 1                                |
| XIX.   | Dunrobin .....                                                                                                  | 3·85           | + 1·45                                         | ·74                              | 28              | 20   | 65·0                               | 8               | 38·0 | 30              | 0         | ...                              |
| "      | S. Ronaldsay (Roeberry) .....                                                                                   | 4·51           | + 1·95                                         | ·69                              | 18              | 23   | 62·0                               | 2               | 40·0 | 29              | 0         | 0                                |
| XX.    | Dromore Castle .....                                                                                            | 6·24           | + 1·26                                         | ·92                              | 8               | 23   | 68·0                               | 1               | 48·0 | 4, 21           | 0         | ...                              |
| "      | Waterford (Brook Lodge) ...                                                                                     | 7·10           | + 3·68                                         | ·98                              | 16              | 23   | 71·0                               | 13              | 40·0 | 30              | 0         | ...                              |
| "      | O'Briensbridge (Ross) .....                                                                                     | 9·01           | ...                                            | 1·43                             | 24              | 26   | 74·0                               | 2               | 47·0 | f               | 0         | 0                                |
| XXI.   | Carlow (Browne's Hill) .....                                                                                    | 5·54           | + 2·57                                         | ·87                              | 17              | 25   | ...                                | ...             | ...  | ...             | ...       | ...                              |
| "      | Dublin (Fitz William Square)                                                                                    | 4·95           | + 2·43                                         | ·99                              | 8               | 25   | 69·2                               | 11              | 45·6 | 30              | 0         | 0                                |
| XXII.  | Ballinasloe .....                                                                                               | 6·82           | + 3·64                                         | 1·14                             | 24              | 24   | 66·0                               | 1               | 41·0 | 29 <sup>g</sup> | 0         | ...                              |
| "      | Clifden (Kylemore) .....                                                                                        | 14·41          | ...                                            | 2·05                             | 24              | 27   | ...                                | ...             | ...  | ...             | ...       | ...                              |
| XXIII. | Waringstown .....                                                                                               | 6·04           | + 2·93                                         | 1·11                             | 17              | 29   | 72·0                               | 14              | 40·0 | 27              | 0         | 0                                |
| "      | Londonderry (Creggan Res.) ..                                                                                   | 6·07           | + 1·95                                         | ·82                              | 25              | 27   | ...                                | ...             | ...  | ...             | ...       | ...                              |
| "      | Omagh (Edenfel) .....                                                                                           | 7·45           | + 3·96                                         | 1·24                             | 17              | 27   | 65·0                               | 1               | 43·0 | 29              | 0         | 0                                |

a And 31. b And 15, 16. c And 19, 20. d And 19. e And 27. f Various. g And 30.

+ Shows that the fall was above the average ; — that it was below it.

# METEOROLOGICAL NOTES ON AUGUST, 1891.

ABBREVIATIONS.—Bar. for Barometer; Ther. for Thermometer; Max. for Maximum; Min. for Minimum; T for Thunder; L for Lightning; T S for Thunderstorm; R for Rain; H for Hail. S for Snow.

## ENGLAND.

STRATHFIELD TURGISS.—The wettest August on record, at this station, for more than 30 years. Temperature very much below the average. Heavy storm and R on the 20th. T and L on 4th; T on 3rd and 21st.

ADDINGTON.—This August R has only once been exceeded, and that by only .01 in., during 20 years, viz., in August, 1878. R falling so often, and in such quantities, prevented many from securing the hay crop, and did much damage to grain crops. Temp. low throughout, the night of the 30th being very cold. Brook flooded on the 28th. TSS on 3rd and 23rd.

BURY ST. EDMUNDS, WESTLEY.—TS on 10th, and T heard on 2nd, 3rd, and 4th. The corn stood the R well till the 27th, but wheat and barley were considerably damaged at the close, though, owing to high winds, not so much as might be expected.

LANGTON HERRING.—The wettest month since November, 1888, and the coldest and wettest August in 20 years. The temp. never once rose above 69°, 72° being the previous lowest max. The mean temp. at 9 a.m., 59°·5, is 2°·7 below the average. The grain crops are considerably injured. T on 3rd, 4th, 5th, and 23rd.

BODMIN.—Very unseasonable, with excessive R and some very heavy falls, especially on the 17th (1·04 in.), the 20th (1·54 in.), and the 27th (.86 in.). Very hindering for harvest operations. The wettest August for more than 20 years. Rather cold and stormy, especially on 25th and 26th. August, 1852, was very similar.

STROUD.—Heavy showers, with T and L on the 10th, when .32 in. of R fell in 10 minutes at 2 p.m., T on 4th, 21st, and 23rd. Gale from the S.W. on 25th.

WOOLSTASTON.—Cold, wet, and stormy, with scarcely any sunshine; a disastrous harvest month. Only six days without R. A severe gale on the 25th. Scarcely any grain cut at the end of the month, and hay harvest not finished. Mean temp. 56°·5. TSS on the 4th and 21st.

ORLETON.—A cold, wet month; in fact the wettest month of August since 1879. The max. temp. was above 70° on only 5 days, and the max. for the month (75° on 14th) was the lowest August max. recorded here since 1867. Mean temp. about 1° below average. Great gale on night of 25th, doing much damage to hops and fruit. T and L on 4th and 21st.

LEICESTER, BARKBY.—Mean temp. of the month, 59°·7. T on 5 days. From June 23rd to August 31st inclusive there have been 47 days on which R fell out of 70, or two days out of three. Very trying for haymakers, and now for those getting their harvest. High wind from 24th to 27th.

HULL, PEARSON PARK.—TSS with H and R on 28th and 29th.

NEWCASTLE-ON-TYNE.—In July and August 9·55 in. of R fell, or more than the aggregate of the previous six months (8·88 in.)

SEATHWAITE.—On the 24th and 25th 10·24 in. of R fell; on the 30th and 31st 5·14 in. fell, and on the 8th and 17th also the falls exceeded an inch.

## WALES.

HAVERFORDWEST.—The month was characterised by excess of R, and the temp. was low for August, never once reaching 70°. Strong winds prevailed, especially on the nights of the 25th, 26th, and 31st, when it blew a full gale. The corn crops have been beaten down in many districts, but no real damage has been done, and there is every prospect of a good harvest if fine weather should set in. The quality of the grain, especially barley and oats, is excellent. During the last week there was a good deal of L at night. Westerly and south-westerly winds prevailed.

## SCOTLAND.

**CARGEN.**—The wettest and most inclement August ever recorded at this station. During the period of 31 years there have been only nine months when this amount of R has been exceeded. Strong gales occurred on the nights of the 25th and 31st. Mean temp. of the month  $1^{\circ}6$  below the average. Sunshine 66 hours less than the average. T on 2nd, 21st, and 29th. The damage done to the cut and growing corn has been most serious, and the potato disease is showing itself extensively in this district.

**JEDBURGH.**—The month has been unsettled, with much R and wind and a very sunless sky. Hay in pasture district much injured; corn cutting hardly commenced at the close, and will not be general for a fortnight, even with much sunshine; T and L on the 3rd, 18th, 19th and 20th.

**CULLODEN.**—The weather was cold, with a very small amount of sunshine, and at times heavy R. Crops late; harvest not commenced.

**S. RONALDSAY, ROEBERRY.**—A very wet month; R much above the average.

## IRELAND.

**WATERFORD, BROOK LODGE.**—The wettest August for over 32 years; the wettest month since February, 1884. Mean temp.  $57^{\circ}2$ . T on 3rd, T and L on 21st;  $\cdot 15$  in. of R fell in 12 minutes on the 5th, and on the 25th  $\cdot 77$  in. between 9 a.m. and 6 p.m.; gales from S.W. on 25th and 31st.

**O'BRIENSBRIDGE, ROSS.**—The R of the month has beaten the August record of 43 years. In 1848 there fell  $9\cdot 80$  in., but on fewer days, and the effect was less disastrous to crops. T and L was of frequent occurrence.

**DUBLIN.**—An exceedingly unsettled, cool, rainy and even stormy month; it being the third consecutive year in which August has been unfavourable. High winds on 13 days attaining the force of a gale on three occasions 12th, 26th, and 31st; TS on the 9th, T on the 3rd and 21st, L on 28th, H on the 3rd. A solar halo was seen on the 30th, and lunar rainbows appeared on the night of the 25th.

**BALLINASLOE.**—Heavy R and strong gales occurred after the 8th; corn much damaged; potato blight appeared about the middle of the month.

**CLIFDEN, KYLEMORE.**—On six days the fall exceeded  $1\cdot 00$  in., while in 48 hours on 24th and 25th  $3\cdot 07$  in. fell, and in the same time on 30th and 31st,  $3\cdot 32$  in. fell.

**WARINGSTOWN.**—Unusually wet, especially the last fortnight; a good deal of meadow hay was lost in consequence, and considerable damage was done to other crops; oats laid, and potatoes in most cases showing disease. A fine September would do much to repair the damage done as yet.

**EDENFEL.**—The R of August ( $7\cdot 45$  in.) of which  $5\cdot 30$  in. fell during the last 15 days, is by far the heaviest fall recorded here during 27 years in any summer month, and has only once been exceeded in any month, viz. : by  $7\cdot 67$  in. in December, 1876. The average R of the first six months was nearly one-third short of the average, but this has been exactly recouped by the fall of the last two months; this, coupled with the fact that an August rainfall above the average is almost always followed by a September fall below the average, is the one ground of hope left us. Late hay is irretrievably damaged. Potatoes though gone in the haulm are sound at the root, and oats—our staple crop—encased in its hardy husk, cares little for rain if fine weather only follows.